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(71) Applicant(s)
NEC Corporation
(Incorporated in Japan)
7-1,Shiba 5-chome, Minato-ku, Tokyo, Japan

(72) Inventor(s)
Michihito Ohtsuki

(74) Agent and/or Address for Service
John Orchard & Co
Staple Inn Buildings North, High Holborn, LONDON,
WC1V 7PZ, United Kingdom

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(54) Abstract Title
Selecting an annunciator in a cellular phone on reception of an email

(57) A cellular phone has at least two annunciators (e.g. ring tone, synthesized voice, vibrator, screen display) for informing the user of the receipt of an email or the content of an email. An email analyzer detects an address of a transmitter and the characteristics of a received email and outputs a first detection signal. A second detection signal is output depending on whether or not the phone is folded. A third detection signal is output depending on whether or not the phone is connected to an adaptor in a vehicle. A controller selects an annunciator according to the first to third detection signals. The phone can also be set into various modes in which a particular annunciator is selected. Thus email reception and content can be announced by synthesised voice if the phone is folded or in a vehicle and personal emails can be detected and announced in a more private manner.

Fig.7

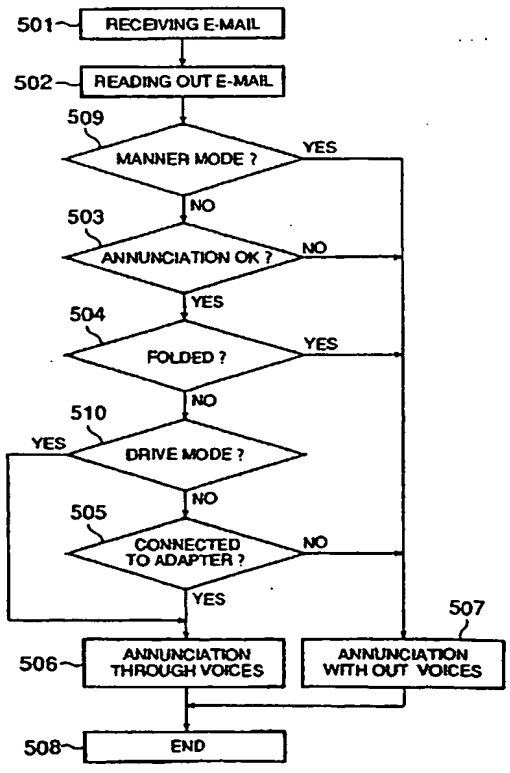

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FIG.1

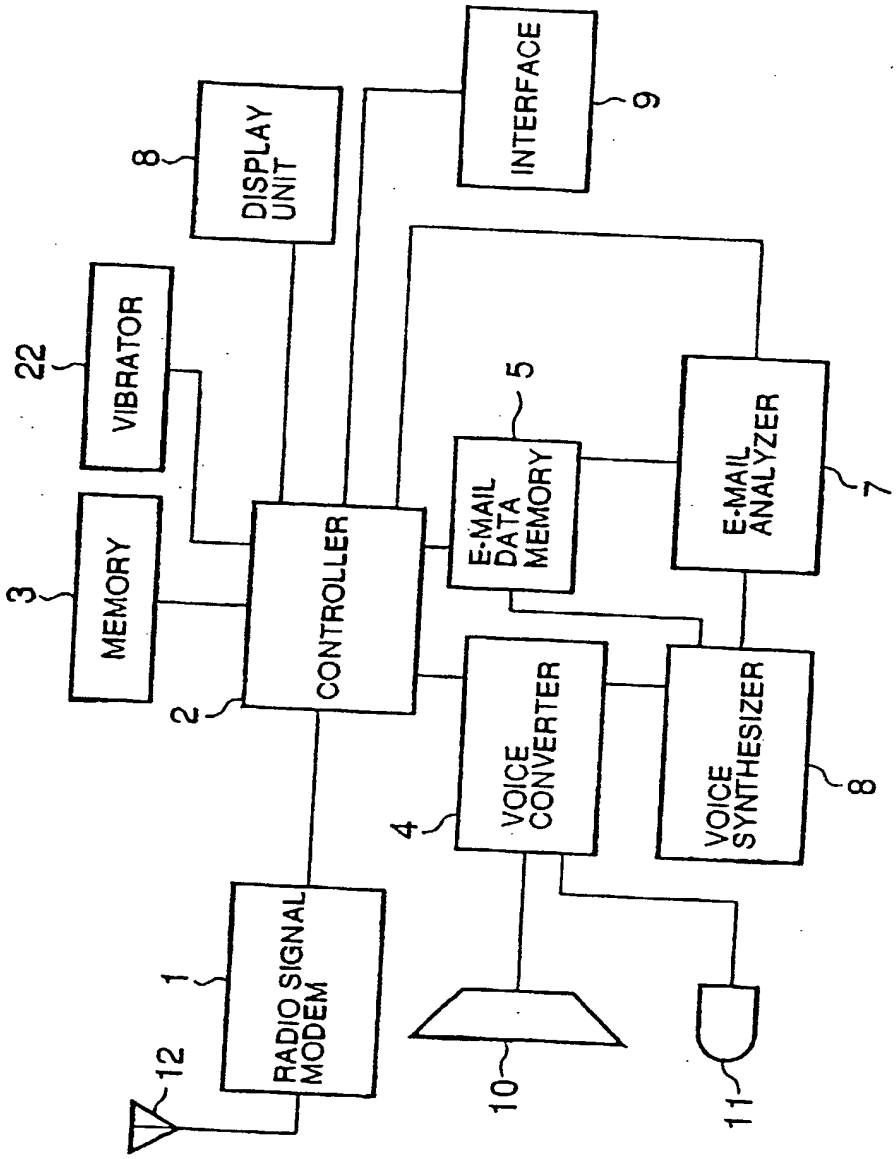


FIG. 2

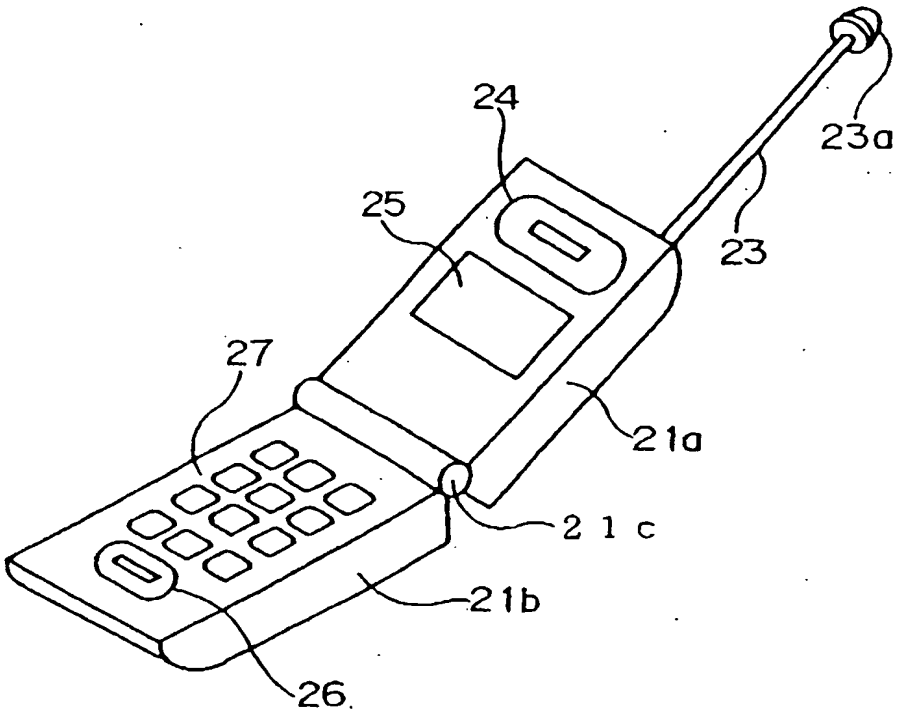
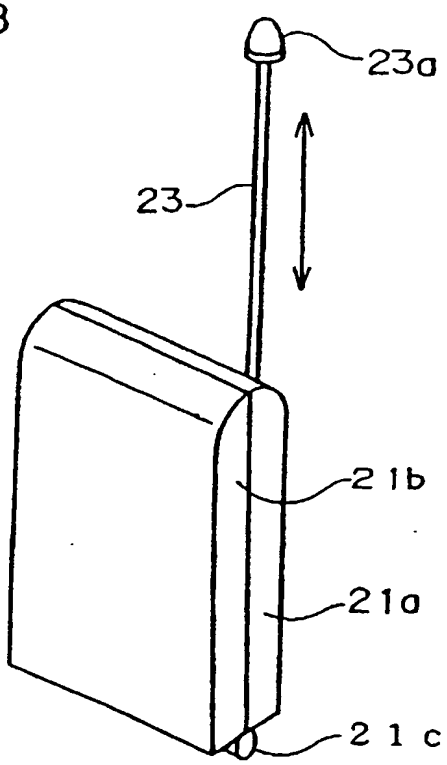


FIG. 3



F I G. 4

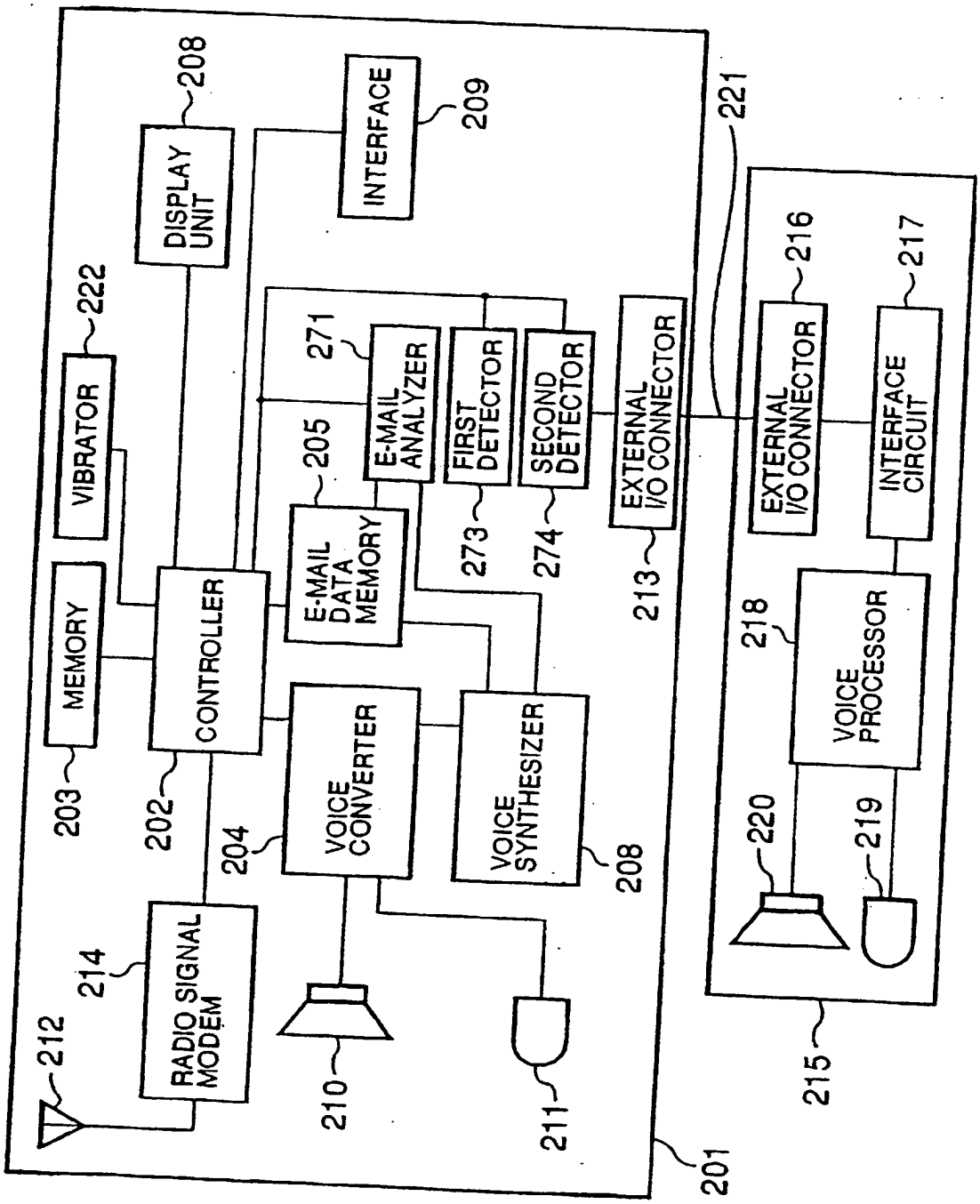
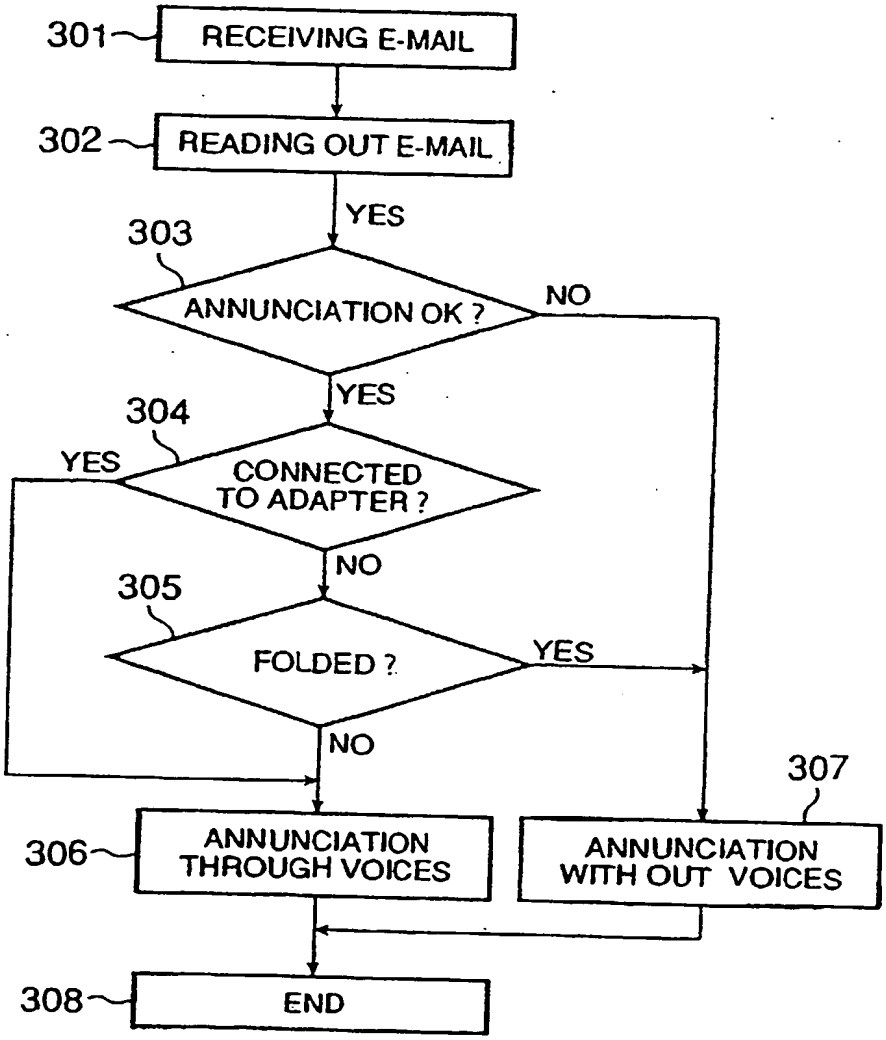


FIG.5



F I G. 6

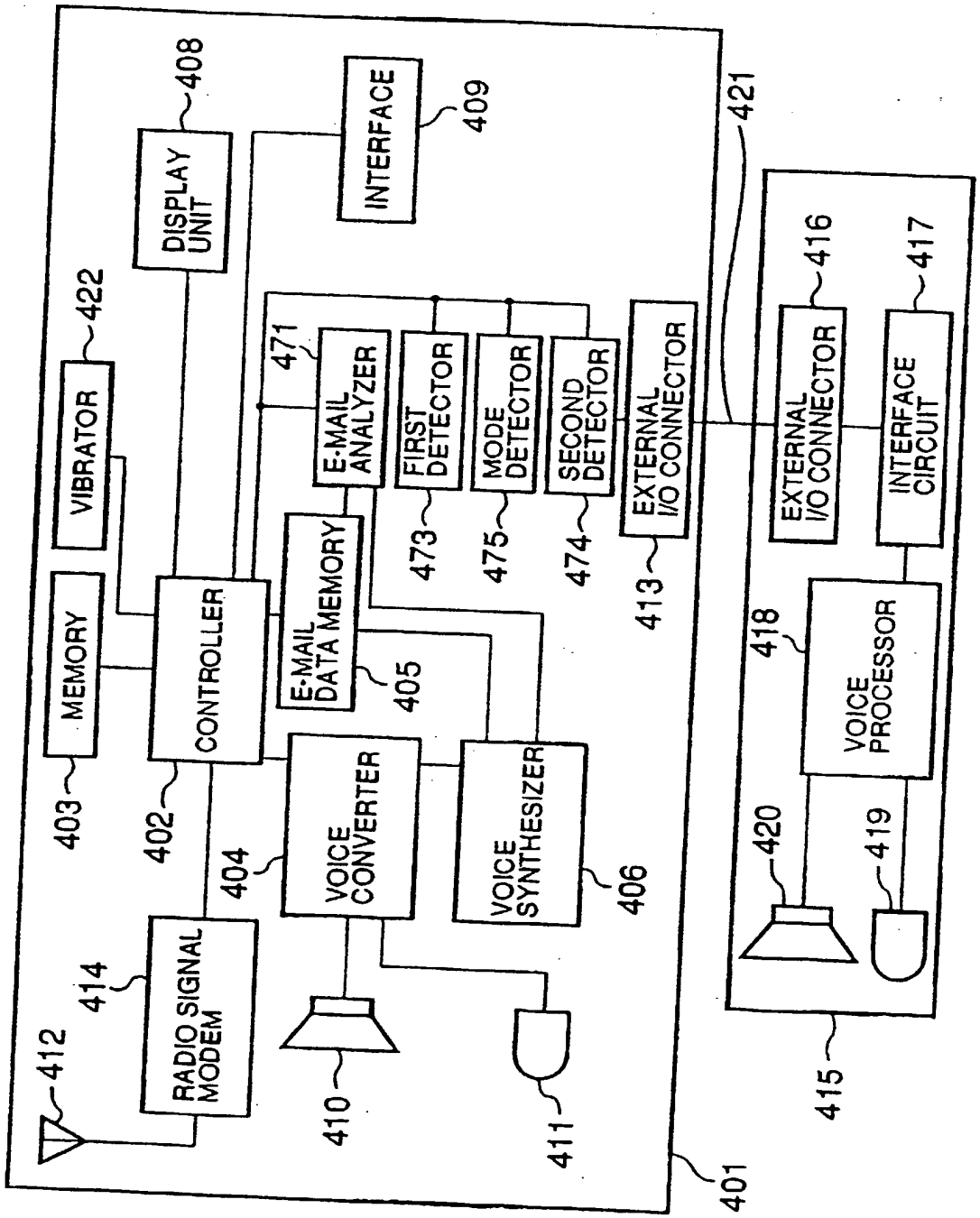
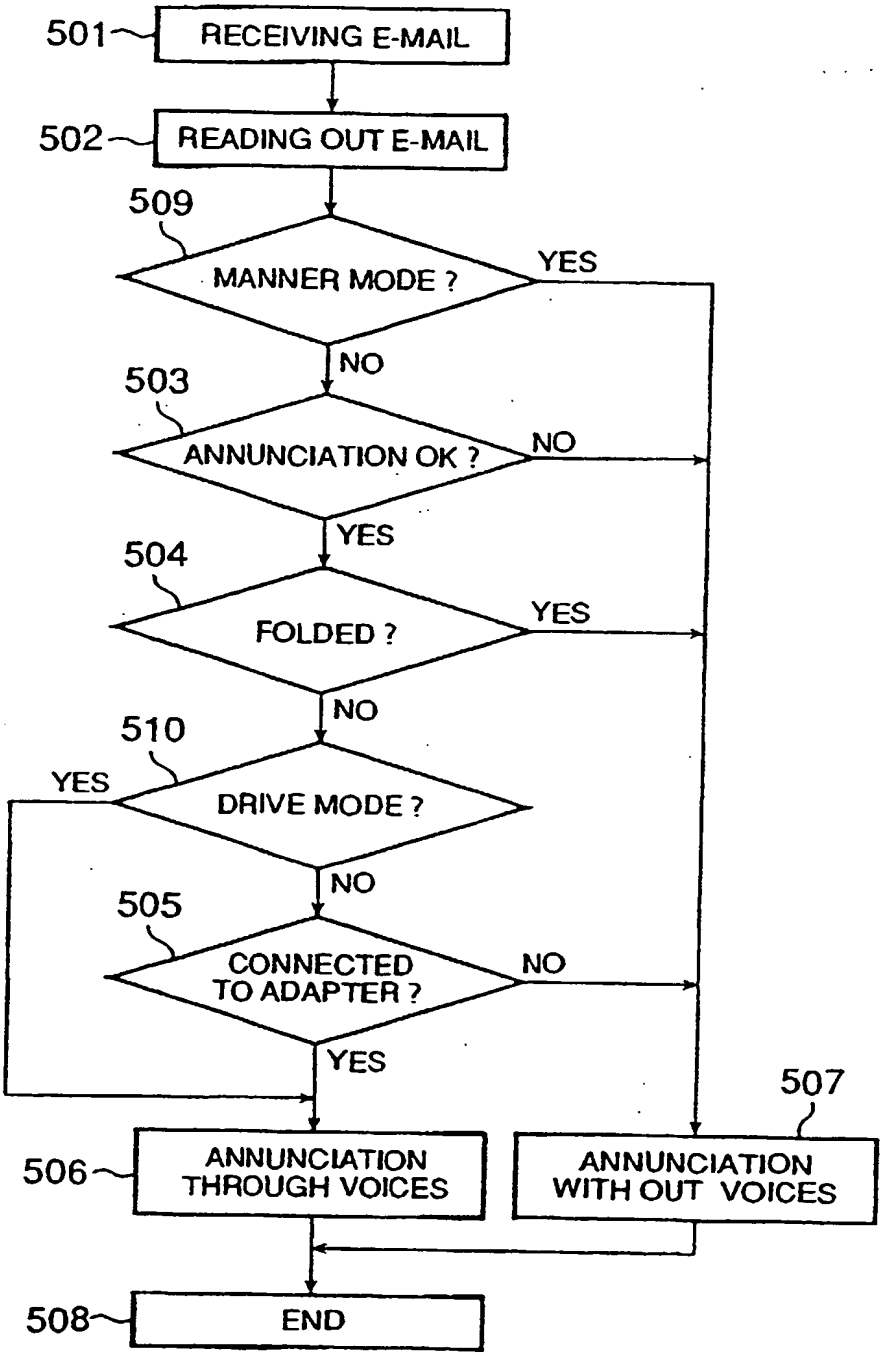


Fig.7



CELLULAR PHONE AND METHOD OF OPERATION

This invention relates to a cellular phone and to a method of its operation.

In order to enable the invention to be better understood, there will be described below, by way of example, a particular foldable cellular phone and the method of its operation at the time that it receives a call.

A cellular phone is almost always with a user. However, a user is not always able to respond to a call. For instance, while a user is driving a car, even if a call is received by the cellular phone, a response may not be possible. Another instance is that of the receipt of an e-mail while a user is driving a car. The driver of the car may know of the receipt of an e-mail by the phone rings, but be unable to see the content of the received e-mail.

Thus, there is a need for a cellular phone which makes it more easy for a user to confirm the content of a received e-mail.

In response to such a need, Japanese Unexamined Patent Publication No. 8-97854 proposes a cellular phone which displays the content of a received e-mail on a display screen immediately upon the receipt of an e-mail.

In Japanese Unexamined Patent Publication No. 10-224861 it has been proposed that a cellular phone should include means for detecting

whether a cellular phone has received a voice communication or an e-mail, means for starting the communication when a voice communication is received, and means, when an e-mail is received, for storing a received e-mail in a memory, and displaying the content of the received e-mail on a display screen.

In Japanese Unexamined Patent Publication No. 2000-307730 it has been suggested that a cellular phone should include means for outputting the content of a received e-mail by means of a synthesized voice, and means for displaying the content of a received e-mail on a display screen.

The above-mentioned cellular phones are designed, to display the content of a received e-mail or to output the content of a received e-mail through means of a synthesized voice on the receipt of an e-mail.

Accordingly, if a user selects an annunciation by means of a synthesized voice, but forgets that annunciation by means of a synthesized voice has been selected, the annunciation of the receipt of an e-mail will be made by a synthesized voice, even in the case in which the user does not want an announcement to be made by a synthesized voice.

In particular, if a user has a foldable cellular phone, the user cannot see an e-mail that is displayed on a display screen, unless the folded cellular phone is opened.

Hence, for instance, when a user is driving a car, it is not possible immediately for the user to confirm the content of a received e-mail.

While a user is driving a car, a foldable cellular phone is usually folded or closed. If a user wants to confirm whether the announcement of

the content of a received e-mail by means of a synthesized voice is selected, or if a user selects the annunciation of the content of a received e-mail by a synthesized voice, while driving the car, it is necessary to open the folded cellular phone with both hands. Hence, it is quite difficult or almost impossible to confirm how a cellular phone has been set, or to set a cellular phone in the desired manner.

As a result, the user has to bear in mind whether an announcement by a synthesized voice has been selected.

As explained, the above-mentioned conventional cellular phones have the problems that an announcement may not be made when necessary, because a user has forgotten to select that an announcement by a synthesized voice is to be made, and that an announcement may be made when it is not required, because a user has forgotten to turn off the selection of an announcement by a synthesized voice.

In order to solve such a problem, there is suggested, in Japanese Patent Application No. 11-336381 (not yet published), a cellular phone which announces the content of a received e-mail by means of a synthesized voice in accordance with a setting made by a user.

In the last mentioned suggested cellular phone, after a user has confirmed the receipt of an e-mail, if the user operates the cellular phone in a predetermined manner, the content of a received e-mail is reproduced by a synthesized voice.

However, it is necessary for the user to carry out a predetermined operation of the cellular phone, in order for the content of a received e-mail

to be reproduced by a synthesized voice. Thus, for instance, when a user is driving a car, it is not possible to carry out the predetermined operation of the cellular phone, and hence to confirm the content of a received e-mail.

A feature of a cellular phone, and of its method of operation, to be described below, by way of example, in the belief that it will enable the invention to be better understood, is that it is capable of minimizing the volume of work which a user has to perform in setting a cellular phone into a desired mode, and in determining whether the content of a received e-mail is announced by a synthesized voice, in accordance with a condition of use.

A particular cellular phone to be described below, by way of example, includes (a) at least two annunciators each of which informs a user of at least one of receipt of an e-mail and the content of a received e-mail, (b) an e-mail analyzer which detects the address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a detection signal in accordance with the detection, and (c) a controller which selects one of the two annunciators in accordance with the first detection signal, and operates the thus selected annunciator.

The controller identifies a transmitter of an e-mail, based on an address indicated in the first detection signal transmitted from the e-mail analyzer. Hence, for instance, when the content of a received e-mail will not give any problems if it is announced by a voice, such as a weather report, or traffic news, the controller operates an annunciator which announces the content of an e-mail by means of a voice, thereby to inform a user of the content of a received e-mail. On the other hand, when a received e-mail is

a private one, the controller informs the user only of the receipt of an e-mail, without announcing the content of the received e-mail by a voice, or displays the content of a received e-mail on a display screen.

Herein, the characteristics of an e-mail indicate whether or not a received e-mail is to be announced by means of a voice.

The controller judges the characteristics of a received e-mail, based on the first detection signal transmitted from the e-mail analyzer. If the received e-mail is allowed to be announced audibly by means of a voice, the controller informs the user only of the receipt of an e-mail, without announcing the content of the received e-mail by means of a voice, or the content of a received e-mail is displayed on a display screen.

In the cellular phone being described, the controller selects an appropriate annunciator in accordance with the first detection signal transmitted from the e-mail analyzer, and operates the annunciator thus selected. Hence, an announcement can be appropriately made to a user in accordance, for example, with an address and/or other characteristic of a received e-mail.

Herein, the term "content of a received e-mail" means all information about a received e-mail, such as the name and an address of an e-mail transmitter, the subject matter of an e-mail, the date and time at which an e-mail has been received, or particular sentences in an e-mail.

It is preferable that the cellular phone further includes a mode judge which judges which mode the cellular phone is in, and transmits a second detection signal in accordance with the judgement, in which case, the

controller selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

A cellular phone is usually designed to have various operating modes, such as a drive mode in which a caller is informed that the user of a called phone is now driving a car, and a manner mode in which any voice output is prohibited.

The mode judge detects which mode the cellular phone is now in, and transmits a second detection signal in accordance with the detection. On receipt of the first and second detection signals, the controller selects one of the annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected. Thus, an appropriate announcement can be made to a user in accordance with the characteristics of a received e-mail and the mode which the cellular phone is in.

Each of the annunciators may include (a1) a voice synthesizer, which synthesizes a voice indicating the content of the received e-mail, (a2) a display unit, which displays the content of a received e-mail on a display screen, and (a3) an informer, which informs a user of the receipt of an e-mail, either alone or in combination.

For instance, the informer may have a light emitting diode (LED) turned on and off when a call or an e-mail is received, or a vibrator which vibrates a body of the cellular phone when a call or an e-mail is received.

However, it should be noted that the annunciator is not to be limited to these types. The annunciator may have any structure if it can make an announcement in any way.

In another particular arrangement to be described below, by way of example, a cellular phone includes (a) at least two annunciators each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail, (b) an e-mail analyzer which detects the address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a first detection signal in accordance with the detection, (c) a first detector which detects whether the cellular phone is folded, and transmits a second detection signal in accordance with the detection, and (d) a controller which selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

Where the cellular phone is a foldable type, it is usually considered not to be in use if it is folded. Hence, when the controller receives the second detection signal indicating that the cellular phone is not folded, from the first detector, the controller assumes that the cellular phone is in use, or when the controller receives the second detection signal indicating that the cellular phone is folded, from the first detector, the controller assumes that the cellular phone is not in use.

The controller identifies a transmitter of an e-mail, based on an address indicated in the first detection signal transmitted from the e-mail analyzer. Hence, for instance, when the content of a received e-mail is such that it will give no problem, e.g. a weather report or traffic news, if it is announced audibly by means of a voice. The controller further judges whether the cellular phone is folded or not, on the basis of the second

detection signal. If the cellular phone is not folded, the controller operates an annunciator which announces audibly the content of an e-mail by means of a voice, for instance thereby to inform a user of the content of a received e-mail. If the cellular phone is folded, the controller informs a user only of the receipt of an e-mail, or displays the content of a received e-mail on a display screen.

On the other hand, when a received e-mail is a private one, the controller informs a user only of the receipt of an e-mail without announcing audibly the content of the received e-mail by means of a voice, or the content of a received e-mail is displayed on a display screen.

The controller selects an appropriate annunciator in accordance with both the first detection signal transmitted from the e-mail analyzer and the second detection signal transmitted from the first detector, and operates the annunciator thus selected. Hence, an announcement can be made to a user appropriately, in accordance with an address and/or the characteristics of the received e-mail, and further according to whether the cellular phone is folded or not.

Further a particular cellular phone to be described includes (a) at least two annunciators, each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail, (b) a first detector which detects whether or not the cellular phone is folded, and transmits a first detection signal in accordance with the detection, (c) a second detector which detects whether or not the cellular phone is connected to an adapter in a vehicle, and transmits a second detection signal in accordance with the

detection, and (d) a controller which selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

It is usually considered that a user of a cellular phone is driving a car, if the cellular phone is connected to an adapter in the vehicle. Hence, when the controller receives the second detection signal from the second detector indicating that the cellular phone is connected to the adapter, the controller assumes that the cellular phone is not in use, or when the controller receives the second detection signal from the second detector indicating that the cellular phone is not connected to the adapter, the controller assumes that the cellular phone is in use.

The controller selects an appropriate annunciator in accordance with the first detection signal transmitted from the first detector and the second detection signal transmitted from the second detector, and operates the annunciator thus selected. Hence, annunciation can be appropriately made to a user in accordance with whether the cellular phone is folded or not, and further according to whether or not the cellular phone is connected to an adapter in a vehicle.

Still further a particular cellular phone to be described includes (a) at least two annunciators, each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail, (b) an e-mail analyzer which detects the address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a first detection signal in accordance with the detection, (c) a first detector which detects

whether or not the cellular phone is folded, and transmits a second detection signal in accordance with the detection, (d) a second detector which detects whether or not the cellular phone is connected to an adapter in a vehicle, and transmits a third detection signal in accordance with the detection, and (e) a controller which selects one of the two annunciators in accordance with the first to third detection signals, and operates the annunciator thus selected.

In this last mentioned particular cellular phone, the controller selects an appropriate annunciator in accordance with the first detection signal transmitted from the e-mail analyzer, the second detection signal transmitted from the first detector, and the third detection signal transmitted from the second detector, and operates the thus selected annunciator. Hence, an announcement can be appropriately made to a user in accordance with an address and/or the characteristics of a received e-mail, and further according to whether the cellular phone is folded or not, and still further according to whether or not the cellular phone is connected to an adapter in a vehicle.

For instance, the controller operates a voice synthesizer when the cellular phone is connected to an adapter. The controller may according to another possibility operate the informer when the cellular phone is not connected to the adapter and the cellular phone is folded. Another possible arrangement is for the controller to operate the voice synthesizer when the cellular phone is not connected to the adapter and the cellular phone is not folded.

One particular method of operating a cellular phone to be described

below, by way of example in order to enable the invention to be better understood, includes the steps of (a) detecting the address of a transmitter of a received e-mail and the characteristics of a received e-mail, and judging whether the received e-mail can be announced audibly to a user by a voice, (b) detecting whether the cellular phone is connected to an adapter in a vehicle, and (c) outputting the content of the received e-mail audibly by means of a voice when the cellular phone is connected to the adapter.

Where appropriate, a user can be informed of the contents of a received e-mail in dependence upon an address and/or the characteristics of a received e-mail, and further upon whether or not the cellular phone is connected to an adapter.

A further method of operating a cellular phone, to be described below, by way of example, in order to enable the invention to be better understood includes the steps of (a) detecting the address of a transmitter of a received e-mail and the characteristics of the received e-mail, and judging whether or not the received e-mail can be announced audibly to a user by a voice, (b) detecting whether or not the cellular phone is connected to an adapter in a vehicle, (c) detecting whether or not the cellular phone is folded, when the cellular phone is not connected to the adapter, and (d) outputting the contents of a received e-mail by means of a voice when the cellular phone is not folded.

Where appropriate, the user can be informed of the content of a received e-mail in dependence upon an address and/or the characteristics of a received e-mail, and further upon whether or not the cellular phone is

connected to an adapter, and still further upon whether or not the cellular phone is folded.

Yet another method of operating a cellular phone to be described below in the belief that it will enable the invention to be better understood includes the steps of (a) detecting the address of a transmitter of a received e-mail and the characteristics of a received e-mail, and judging whether the received e-mail can be announced audibly to a user by means of a voice, (b) detecting whether or not the cellular phone is connected to an adapter in a vehicle, (c) detecting whether or not the cellular phone is folded, when the cellular phone is not connected to the adapter, and (d) informing a user of the receipt of the received e-mail, when the cellular phone is folded.

Where appropriate, the user of a cellular phone, can be informed of the content of a received e-mail in dependence upon an address and/or the characteristics of a received e-mail, and further upon whether or not the cellular phone is connected to an adapter, and still further upon whether or not the cellular phone is folded.

As mentioned previously whether the content of a received e-mail is announced audibly to a user by means of a voice is automatically determined in dependence on the circumstance of a user. Hence, even if a user is driving a car and cannot manipulate a cellular phone, for instance, the user can confirm the content of a received e-mail without carrying out any operation on a cellular phone.

Arrangements, which it is believed will enable the invention to be better understood, will now be described, by way of example, with reference

to the accompanying drawings, in which:-

Fig. 1 is a block schematic circuit diagram of a cellular phone,

Fig. 2 is a perspective view of a cellular phone which is unfolded,

Fig. 3 is a perspective view of a cellular phone which is folded,

Fig. 4 is a block schematic circuit diagram of a foldable cellular phone, such as that shown in Figs. 2 and 3,

Fig. 5 is a flow chart for use in describing the operation of the cellular phone shown in Figs. 2 and 3,

Fig. 6 is a block schematic circuit diagram of a further foldable cellular phone, and

Fig. 7 is a flow chart for use in describing the operation of the cellular phone referred to in Fig. 6.

The cellular phone shown in Fig. 1 includes an antenna 12 through which radio signals are received and transmitted, a radio signal modem 1 which modulates a radio signal to be transmitted and demodulates a received radio signal, a controller 2, which includes a large scale integrated circuit (LSI) and which receives demodulated radio signals from the radio signal modem 1, a memory 3 for storing data, such as data indicating the conditions in which the cellular phone is set, a voice converter 4, which converts radio signals into voice signals when a received radio signal includes voice signals, an e-mail data memory 5 for storing the content of received e-mails, a voice synthesizer 6, which synthesizes a voice when the content of a received e-mail is to be output audibly as a voice, a speaker 10 which outputs the voice signals converted by the voice converter 4, through

a voice synthesized by the voice synthesizer 6, a microphone 11 which collects the voice of a user, an e-mail analyzer 7, which detects the address of a transmitter of a received e-mail and the characteristics of a received e-mail, and transmits a first detection signal in accordance with the detection, a display unit 8 which displays various data, such as the content of a received e-mail, an interface 9 through which a user inputs data into the controller 2, and a vibrator 22 which vibrates the body of the cellular phone.

The above described cellular phone operates as follows.

When an e-mail is received, the radio signal modem 1 processes the received radio signals, for instance, the received radio signals are demodulated.

Then, the e-mail analyzer 7 detects the address of a transmitter and the characteristics of the received e-mail, and transmits a first detection signal indicative of the thus detected address and the characteristic, to the controller 2.

The controller 2 judges whether the received e-mail is allowed to be announced audibly by means of a voice, based on the characteristics of the received e-mail, indicated in the first detection signal.

The controller 2 further identifies a transmitter of the received e-mail, by virtue of the address indicated in the first detection signal, and announces the content of the received e-mail to a user in accordance with a transmitter of the received e-mail.

For instance, when the received e-mail is allowed to be announced audibly by means of a voice and a transmitter of the received e-mail is a

data source, which transmits various data such as a weather report or the traffic news, the controller 2 judges that no problems will be caused even if the content of the received e-mail is announced by means of a voice, and accordingly, the voice synthesizer 6 is operated.

The voice synthesizer 6 synthesizes a voice in accordance with the content of the received e-mail. The synthesized voice is output through the speaker 10.

If a transmitter of the received e-mail is an individual, that is, if the received e-mail is a private one, the controller 2 operates the vibrator 22 to inform a user of receipt of an e-mail. As an alternative, or in addition, the controller 2 displays the content of the received e-mail on a display screen of the display unit 8.

If the received e-mail cannot be announced by means of a voice, the controller 12 either operates the vibrator 22 to inform the user of the receipt of the e-mail, or displays the content of the received e-mail on the display screen of the display unit 8, without announcing the content of the received e-mail to the user by voice means.

The controller 2 selects the voice synthesizer 6, the vibrator 22 or the display unit 8 in accordance with the first detection signal transmitted from the e-mail analyzer 7, and operates the annunciator thus selected. Hence, annunciation can be appropriately made to a user in accordance with an address and/or the characteristics of a received e-mail.

The content of the received e-mail may mean all of the information about a received e-mail, such as the name and an address of an e-mail

transmitter, the subject matter of the e-mail, the date and the time at which the e-mail was received, or particular sentences of an e-mail message.

Referring to Figs. 2 and 3 the cellular phone shown is foldable, and includes an upper half 21a, a lower half 21b, a hinge 21c about which the upper and lower halves 21a and 21b are respectively rotatable, an antenna 23, and a helical antenna 23a mounted at the top of the antenna 23.

The antenna 23 is extendable from the upper half 21a and contractable into the upper half 21a.

The upper half 21a includes a speaker 24 and a display screen 25. The lower half 21b includes a receiver 26 and numeral keys 27.

Since the upper and lower halves 21a and 21b are rotatable about the hinge 21c, the cellular phone can be folded, as illustrated in Fig. 3, so that the upper and lower halves 21a and 21b overlap each other. When the cellular phone is not folded, as illustrated in Fig. 2, the upper and lower halves 21a and 21b make an angle of about 180 degrees.

Referring to Fig. 4 there is shown a cellular phone 201 of the type shown in Figs. 2 and 3.

The cellular phone 201 is detachably connected to an adapter 215 in a vehicle through a cable 221.

The cellular phone 201 has an antenna 212 (equivalent to the antenna 23 illustrated in Figs. 2 and 3) through which a radio signal is received and transmitted, a radio signal modem 214, which modulates a radio signal to be transmitted therefrom and which demodulates a received radio signal, a controller 202 in the form of an LSI for receiving demodulated

radio signals from the radio signal modem 1, a memory 203 for storing data, such as data indicating the condition in which the cellular phone is set, a voice converter 204, which converts radio signals into voice signals when a received radio signal includes voice signals, an e-mail data memory 205 for storing the content of received e-mails, a voice synthesizer 206, which synthesizes a voice when the content of a received e-mail is to be output by means of a voice, a speaker 210 which outputs the voice signals converted by the voice converter 204, through a voice synthesized by the voice synthesizer 206, a microphone 211 which receives the voice of a user, an e-mail analyzer 271 which detects an address of a transmitter of a received e-mail and the characteristics of a received e-mail, and transmits a first detection signal in accordance with the detection, a display unit 208 on which various data such as the content of a received e-mail are displayed, an interface 209 through which a user inputs data into the controller 202, a vibrator 222 which vibrates the body of the cellular phone, a first detector 273 which detects whether the cellular phone 201 is folded or not, and transmits a second detection signal in accordance with the result of the detection, a second detector 274 which detects whether the cellular phone 201 is connected to the adapter 215 or not, and transmits a third detection signal in accordance with the result of the detection, and an external I/O connector 213 to which the adapter 215 is connected through the cable 221.

The adapter 15 has an external I/O connector 216 to be connected to the cellular phone 201 through the cable 221, an interface circuit 217 electrically connected to the external I/O connector 216, a microphone 219

which receives the voice of a user, a voice processor 218 which processes the voice of a user input through the microphone 219, and a speaker 220 through which a voice, synthesized by the voice synthesizer 206, is output.

When an e-mail is received in the cellular phone 201, the e-mail analyzer 271 detects the address of a transmitter and the characteristics of the received e-mail, and transmits the first detection signal which is indicative of the address thus detected and the characteristics, to the controller 202.

The first detector 273 detects whether the cellular phone 201 is folded or not, and transmits the second detection signal in accordance with the result of the detection.

The second detector 274 detects whether the cellular phone 201 is connected to the adapter 215 or not, and transmits the third detection signal in accordance with the result of the detection. The judgment as to whether the cellular phone 201 is connected to the adapter 215 is made by detecting whether the external I/O connector 213 of the cellular phone 201 is connected to the external I/O connector 216 of the adapter 215 through the cable 221.

The first to third detection signals are transmitted to the controller 202.

Upon the receipt of the first to third detection signals, the controller 202 operates the voice synthesizer 206 to announce audibly the content of the received e-mail to a user by means of a voice via the speaker 210 and/or 220, operates the vibrator 222 for vibrating the body of the cellular

phone 201 to inform a user of the receipt of an e-mail, or displays the content of the received e-mail on the display screen of the display unit 208, in accordance with the first to third detection signals.

The operation of the cellular phone 201 will now be described with reference to Fig. 5.

After the cellular phone 201 has received an e-mail in step 301, the received e-mail is read out of the e-mail data memory 205, in step 302.

Then, the controller 202 takes the e-mail address of the transmitter out of the data indicated in the first detection signal and transmitted from the e-mail analyzer 271, and judges whether the address is an address which allows an announcement to be made audibly to a user by means of a voice, in step 303.

If the address is not such an address (NO in step 303), the controller 202 informs the user only of the receipt of an e-mail without announcing audibly the content of the received e-mail to the user by means of a voice synthesized by the voice synthesizer 206, in step 307.

For instance, the controller 202 informs the user of the receipt of an e-mail by operating the vibrator 222 for vibrating a body of the cellular phone 201, or by turning on light emitting diodes (not illustrated) incorporated in the cellular phone 201.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, by step 308.

If the received e-mail had an address which allows an audible announcement to be made to a user by means of a voice (YES in step 303),

the controller 202 judges whether the cellular phone 201 is connected to the adapter 215, based on the third detection signal transmitted from the second detector 274, in step 304.

If the cellular phone 201 is connected to the adapter 215 (YES in step 304), the controller 202 informs the user of the receipt of an e-mail, and then, outputs the content of the received e-mail by means of a voice synthesized by the voice synthesizer 206, via the speaker(s) 210 and/or 220, in step 306.

The content of an e-mail to be output by means of a voice may be designed in advance to include not only sentences from the received e-mail, but also data about the received e-mail. Data about a received e-mail may include, for instance, the address of a transmitter, the subject of the e-mail, the date and the time at which the e-mail was received, and whether there is an attached file.

The content of the received e-mail may be output not only by means of a voice synthesized by the voice synthesizer 206, via the speaker 210, but it may also be displayed on a display screen of the display unit 208.

If the cellular phone 201 is not connected to the adapter 215 (NO in step 304), the controller 202 judges whether the cellular phone 201 is folded or not, based on the second detection signal transmitted from the first detector 273, in step 305.

If the cellular phone 201 is folded (YES in step 305), the controller 202 assumes that the cellular phone 201 is not in use, and the controller 202 informs a user only of the receipt of an e-mail without announcing the

content of the received e-mail to a user by means of a voice synthesized by the voice synthesizer 206, in step 307.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 308.

If the cellular phone 201 is not folded (NO in step 305), the controller 202 assumes that the cellular phone 201 is in use, and then, the controller 202 informs a user of the receipt of an e-mail, and outputs the content of the received e-mail through a voice synthesized by the voice synthesizer 206, and the speaker(s) 210 and/or 220, in step 306.

The content of the received e-mail may be not only output by means of a voice synthesized by the voice synthesizer 206, and via the speaker 210 and/or 220, but also displayed on the display screen of the display unit 208.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 308. The cellular phone 201 is then returned to a stand-by mode in which the cellular phone 201 awaits the receipt of the next e-mail.

In the cellular phone 201 described in Figs. 2 and 3, on the receipt of an e-mail, the controller 202 operates the voice synthesizer 206 to announce the content of the received e-mail to a user by means of a voice and via the speaker 210 and/or 220, operates the vibrator 222 for vibrating the body of the cellular phone 201 to inform the user of the receipt of an e-mail, or displays the content of the received e-mail on a display screen of the display unit 208, in accordance with the first to third detection signals.

Thus, when a user is driving a car and cannot operate the cellular phone 201, for instance, the content of a received e-mail is announced to a user by means of a synthesized voice without the need for a user to carry out any operation.

On the other hand, when a user is able to manipulate the cellular phone 201, the user can set the cellular phone 201 such that no announcement of the content of a received e-mail by a synthesized voice is made.

A foldable cellular phone is usually open when used, and usually closed when not used. Thus, when the cellular phone 201 is put in a bag, for instance, it would be possible to avoid any announcement for a user by means of a voice, by appropriately selecting an annunciator in accordance with the third detection signal transmitted by the second detector 274. Hence, a user may receive the announcement of the receipt of an e-mail by means of a voice, only when necessary, without carrying out an extra operation.

In the above-mentioned arrangement of Figs. 2 and 3, the controller 202 makes an announcement to a user by a voice when the controller 202 detects that the cellular phone 201 is not folded, in accordance with the second detection signal. On the contrary, the controller 202 may make an announcement to a user by means of a voice when the controller 202 detects that the cellular phone 201 is folded, in accordance with the second detection signal.

A user may select any of the first to third detection signals to make an

announcement to a user by means of a voice. That is, a user may select the use of all of the first to third detection signals to make an announcement to a user through a voice in a manner as mentioned in the second embodiment, in relation to the arrangement of Figs. 2 and 3, or the user may select any one or two of the first to third detection signals to carry out the operation of the method.

In the above-mentioned arrangement of Figs. 2 and 3, all of the data of a received e-mail is notified to a user. However, only a part of the data of a received e-mail, such as the address of a transmitter of a received e-mail, or a subject of a received e-mail, may be announced to a user audibly by means of a voice. If a user frequently receives an e-mail including long sentences, a user may set the cellular phone 201 in such a manner that only the subject of a received e-mail is announced to a user by means of a voice, in which case, a user may further set the cellular phone 201 such that the content of a particular e-mail is announced to a user by means of a voice by actuating a particular key or button, or by making the controller 202 recognize a voice of a user, for instance. This eliminates the need for reading out junk e-mails.

Referring to Fig. 6, there is shown a cellular phone 401 which is of the foldable type similar to the cellular phone 201 illustrated in Fig. 4.

The cellular phone 401 is detachably connected to an adapter 415 in a vehicle through a cable 421.

The cellular phone 401 has an antenna 412 through which a radio signal is received and transmitted, a radio signal modem 414 which

modulates a radio signal to be transmitted, and demodulates a received radio signal, a controller 402 provided by a LSI and receiving demodulated radio signals from the radio signal modem 1, a memory 403 for storing data such as data indicating the conditions in which the cellular phone is set, a voice converter 404 which converts radio signals into voice signals when a received radio signal includes voice signals, an e-mail data memory 405 for storing the content of received e-mails, a voice synthesizer 406 which synthesizes a voice when the content of a received e-mail is to be output by means of a voice, a speaker 410 which outputs the voice signals converted by the voice converter 404, by means of a voice synthesized by the voice synthesizer 406, a microphone 411 which receives the voice of a user, an e-mail analyzer 471 which detects the address of a transmitter of a received e-mail and the characteristics of a received e-mail, and transmits a first detection signal according to the result of the detection, a display unit 408 which displays various data such as the content of a received e-mail, an interface 409 through which a user inputs data to the controller 402, a vibrator 422 which vibrates the body of the cellular phone, a first detector 473 which detects whether the cellular phone 401 is folded or not, and transmits a second detection signal in accordance with the detection, a second detector 474 which detects whether or not the cellular phone 401 is connected to the adapter 415 or not, and transmits a third detection signal in accordance with the detection, a mode detector 475 which detects which mode the cellular phone 401 is in, and transmits the fourth detection signal in accordance with a result of the detection, and an external I/O connector

413 to which the adapter 415 is connected through the cable 421.

The cellular phone 401 in this embodiment further includes a mode detector 417 in comparison to the cellular phone 201 of the arrangement of Figs. 2 and 3.

The cellular phone 401 may be set into various modes such as a drive mode and a manner mode. If the cellular phone 401 is set in a drive mode, a message that a user is now driving a car, and hence cannot respond to a call is transmitted to a caller, when the user receives a call while driving a car. If the cellular phone is set in a manner mode, a bell or voice indicating the receipt of a call or an e-mail is not output, even if a call or an e-mail is received. A manner mode is suitable for when a user attends a meeting, for instance.

A user can set the cellular phone 401 into his/her desired mode through the interface 409. The mode detector 475 detects in which mode the cellular phone 401 is set, and transmits a fourth detection signal indicating the result of the detection to the controller 402.

The adapter 415 has an external I/O connector 416 to be connected to the cellular phone 401 through the cable 421, an interface circuit 417 electrically connected to the external I/O connector 416, a microphone 419 which receives the voice of a user, a voice processor 418 which processes the voice of a user, input through the microphone 419, and a speaker 420 through which a voice synthesized by the voice synthesizer 406 is output.

The operation of the cellular phone 401 will now be described with reference to Fig. 7.

After the cellular phone 401 has received an e-mail in step 501, the received e-mail is read out of the e-mail data memory 405 in step 502.

Then, the controller 402 judges whether the cellular phone 401 is set in a manner mode, based on the fourth detection signal transmitted from the mode detector 475, in step 509.

If the cellular phone 401 is set in a manner mode (YES in step 509), the controller 402 informs a user only of the receipt of an e-mail in a predetermined manner without making an announcement of the content of a received e-mail by means of a synthesized voice in step 507.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 508.

If the cellular phone 401 is not set in a manner mode (NO in step 509), the controller 402 takes an e-mail address of a transmitter out of data indicated in the first detection signal transmitted from the e-mail analyzer 471, and judges whether the address is an address which allows an announcement to be made to a user by means of a voice, in step 503.

If the address is an address which allows an announcement to be made to a user by means of a voice (YES in step 503), the controller 402 judges whether the cellular phone 401 is folded or not, based on the second detection signal transmitted from the first detector 473, in step 504.

If the cellular phone 401 is folded (YES in step 504), the controller 402 assumes that the cellular phone 401 is not in use, and the controller 402 informs a user only of the receipt of an e-mail without announcing audibly the content of the received e-mail to a user by means of a voice

synthesized by the voice synthesizer 406, in step 507.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 508.

If the cellular phone 401 is not folded (NO in step 504), the controller 402 judges whether or not the cellular phone 401 is set in a drive mode, based on the fourth detection signal transmitted from the mode detector 475, in step 510.

If the cellular phone 401 is set in a drive mode (YES in step 510), the controller 402 informs the user of the receipt of an e-mail, and outputs the content of the received e-mail by means of a voice synthesized by the voice synthesizer 406, via the speaker(s) 410 and/or 420, in step 506.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 508.

If the cellular phone 401 is not set in a drive mode (NO in step 510), the controller 402 judges whether or not the cellular phone 401 is connected to the adapter 415, based on the third detection signal transmitted from the second detector 474, in step 505.

If the cellular phone 401 is connected to the adapter 415 (YES in step 505), the controller 402 informs the user of the receipt of an e-mail, and then, outputs the content of the received e-mail by means of a voice synthesized by the voice synthesizer 406, via the speaker(s) 410 and/or 420, in step 506.

The content of the received e-mail may be output not only by means of a voice synthesized by the voice synthesizer 406, via the speaker(s) 410

and/or 420, but also be displayed on a display screen of the display unit 408.

If the cellular phone 410 is not connected to the adapter 415 (NO in step 505), the controller 402 assumes that the cellular phone 401 is not in use, and the controller 402 informs the user only of the receipt of an e-mail without announcing the content of the received e-mail to a user by means of a voice synthesized by the voice synthesizer 406, in step 507.

Thus, the steps for announcing the receipt of an e-mail to a user are completed, in step 508. The cellular phone 401 is then returned to the stand-by mode in which the cellular phone 401 awaits the receipt of the next e-mail.

The cellular phone 401 provides not only the advantages obtained by the cellular phone 201, but also the advantages that the announcement to a user by means of a voice may be turned on or off in accordance with the mode in which the cellular phone 401 is set.

It will be understood from reading the specification that the word "voice" where used herein includes a "synthesized voice".

Although particular arrangements have been described by way of example, in order to enable the invention to be better understood, it will be appreciated that variations and modifications thereof, as well as other arrangements may be conceived within the scope of the appended claims.

CLAIMS

1. A cellular phone including

(a) at least two annunciators each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail,

(b) an e-mail analyzer which detects an address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a first detection signal in accordance with the detection, and

(c) a controller which selects one of the two annunciators in accordance with the first detection signal, and operates the annunciator thus selected.

2. A cellular phone as claimed in claim 1, further including a mode judge which judges which mode the cellular phone is in, and transmits a second detection signal in accordance with the judgment, and wherein the controller selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

3. A cellular phone as claimed in either claim 1 or claim 2, wherein each of the annunciators includes at least one of

(a1) a voice synthesizer which synthesizes a voice for announcing the content of the received e-mail,

(a2) a display unit for displaying the a content of the received e-mail on a display screen, and

(a3) an informer which informs the user of the receipt of an e-mail.

4. A cellular phone including

(a) at least two annunciators each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail,

(b) an e-mail analyzer which detects the address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a first detection signal in accordance with the detection,

(c) a first detector which detects whether or not the cellular phone is folded, and transmits a second detection signal in accordance with the result of the detection, and

(d) a controller which selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

5. A cellular phone as claimed in claim 4, further including a mode judge which judges which mode the cellular phone is in, and transmits a third detection signal in accordance with the judgment, and wherein the controller selects one of the two annunciators in accordance with the first to third detection signals, and operates the annunciator thus selected.

6. A cellular phone as claimed in either claim 4 or claim 5, wherein each of the annunciators includes at least one of

(a1) a voice synthesizer which synthesizes a voice for announcing the content of the received e-mail,

(a2) a display unit which displays the content of the received e-mail on a display screen, and

(a3) an informer which informs the user of the receipt of an e-mail.

7. A cellular phone including

(a) at least two annunciators each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail,

(b) a first detector which detects whether or not the cellular phone is folded, and transmits a first detection signal in accordance with the detection,

(c) a second detector which detects whether or not the cellular phone is connected to an adapter in a vehicle, and transmits a second detection signal in accordance with the detection, and

(d) a controller which selects one of the two annunciators in accordance with the first and second detection signals, and operates the annunciator thus selected.

8. A cellular phone as claimed in claim 7, including a mode judge which judges which mode the cellular phone is in, and transmits a third detection signal in accordance with the judgment, and wherein the controller

selects one of the two annunciators in accordance with the first to third detection signals, and operates the annunciator thus selected.

9. A cellular phone as claimed in either claim 7 or 8, wherein each of the annunciators includes at least one of

(a1) a voice synthesizer which synthesizes a voice for announcing the content of the received e-mail,

(a2) a display unit which displays the content of the received e-mail on a display screen, and

(a3) an informer which informs a user of the receipt of an e-mail.

10. A cellular phone as claimed in claim 9, wherein the controller operates the voice synthesizer when the cellular phone is connected to the adapter.

11. A cellular phone as claimed in claim 9, wherein the controller operates the informer when the cellular phone is not connected to the adapter and the cellular phone is folded.

12. A cellular phone as claimed in claim 9, wherein the controller operates the voice synthesizer when the cellular phone is not connected to the adapter and the cellular phone is not folded.

13. A cellular phone including

(a) at least two annunciators, each of which informs a user of at least one of the receipt of an e-mail and the content of a received e-mail,

(b) an e-mail analyzer which detects an address of a transmitter of the received e-mail and the characteristics of the received e-mail, and transmits a first detection signal in accordance with the detection,

(c) a first detector which detects whether or not the cellular phone is folded, and transmits a second detection signal in accordance with the result of the detection,

(d) a second detector which detects whether the cellular phone is connected to an adapter in a vehicle, and transmits a third detection signal in accordance with the result of the detection, and

(e) a controller which selects one of the two annunciators in accordance with the first to third detection signals, and operates the annunciator thus selected.

14. A cellular phone as claimed in claim 13, further including a mode judge which judges which mode the cellular phone is in, and transmits a third detection signal in accordance with the judgment, and wherein the controller selects one of the two annunciators in accordance with the first to third detection signals, and operates the annunciator thus selected.

15. A cellular phone as claimed in claim either 13 or claim 14, wherein each of the annunciators includes at least one of

(a1) a voice synthesizer which synthesizes a voice for use in announcing the content of the received e-mail,

(a2) a display unit which displays the content of the received e-mail on a display screen, and

(a3) an informer which informs a user of the receipt of an e-mail.

16. A cellular phone as claimed in claim 15, wherein the controller operates the voice synthesizer when the cellular phone is connected to the adapter.

17. A cellular phone as claimed in claim 15, wherein the controller operates the informer when the cellular phone is not connected to the adapter and the cellular phone is folded.

18. A cellular phone as claimed in claim 15, wherein the controller operates the voice synthesizer when the cellular phone is not connected to the adapter and the cellular phone is not folded.

19. A method of operating a cellular phone, including the steps of

(a) detecting the address of a transmitter of a received e-mail and the characteristics of the received e-mail, and judging whether or not the received e-mail may be announced to a user by means of a voice,

(b) detecting whether the cellular phone is connected to an adapter in a vehicle, and

(c) outputting the content of the received e-mail by means of a voice when the cellular phone is connected to the adapter.

20. A method of operating a cellular phone, including the steps of

(a) detecting the address of a transmitter of a received e-mail and the characteristics of the received e-mail, and judging whether or not the received e-mail can be announced to a user by means of a voice,

(b) detecting whether or not the cellular phone is connected to an adapter in a vehicle,

(c) detecting whether or not the cellular phone is folded, when the cellular phone is not connected to the adapter, and

(d) outputting the content of the received e-mail by means of a voice when the cellular phone is not folded.

21. A method of operating a cellular phone, including the steps of

(a) detecting the address of a transmitter of a received e-mail and the characteristics of the received e-mail, and judging whether or not the received e-mail can be announced to a user by means of a voice,

(b) detecting whether or not the cellular phone is connected to an adapter in a vehicle,

(c) detecting whether or not the cellular phone is folded, when the cellular phone is not connected to the adapter, and

(d) informing the user of the receipt of a received e-mail, when the cellular phone is folded.

22. A cellular phone as claimed in any one of claims 1, 4, 7 or 13 substantially as described herein with reference to Figure 1, Figures 2 to 5, or Figures 6 and 7 of the accompanying drawings.

23. A method of operating a cellular phone as claimed in any one of claims 19, 20 or 21, substantially as described herein with reference to Figure 1, Figures 2 to 5, or Figures 6 and 7 of the accompanying drawings.

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): H4L (LED, LEUG, LEUF, LERA, LECY, LESF)

Int Cl (Ed.7): H04B 1/38, 1/40, H04L 12/58, H04M 1/57, H04Q 7/32

Other: Online Databases: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X, P	GB2349305 A	(NEC) p.17 lines 4-14	1
X, Y	GB2333209 A	(MATSUSHITA) p.29 line 6 - p.30 line 5	X:1-3 Y:4-6
X, Y	GB2329092 A	(ERICSSON) see abstract	X:1-3 Y:4-6
X, Y	GB2314185 A	(NEC) see abstract	X:1-3 Y:4-6
X, Y	US5307059	(CONNARY) col.2 line 31 - col.3 line 10	X:1-3 Y:4-6
Y	GB2339648 A	(NEC) p.8 line 24 - p.10 line 1	4-6

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